

CLAIMS

1. A semiconductor device fabricating method comprising:
an amorphous silicon laminating process for forming an amorphous silicon film
5 (2) on a substrate (1);
an irradiation process for irradiating said amorphous silicon film (2) with laser light (16) to transform at least a part of said amorphous silicon film (2) into a polycrystalline silicon film (3); and
an oxidation process for oxidizing the surface of said polycrystalline silicon film
10 (3) in an atmosphere including oxygen, after said irradiation process, wherein
said laser light (16) is a linear beam having an energy-density gradient of 3 (mJ/cm²)/μm or more in the widthwise direction, and said linear beam is generated by transforming pulse laser light with a wavelength in a range between 350 nm or more and 800 nm or less, and
15 said oxidation process is performed in an atmosphere of saturated water vapor under a pressure of 10 atmospheric pressures or more and at a temperature in a range between 500°C or more and 650°C or less.
2. The semiconductor device fabricating method according to claim 1,
comprising a process for further laminating silicon oxide, by a chemical vapor deposition
20 method, on the upper surface of said polycrystalline silicon film (3) which has been oxidized in said oxidation process.
3. The semiconductor device fabricating method according to claim 1 or 2,
wherein
25 in said irradiation process said amorphous silicon film (2) is irradiated with said laser light (16) such that said widthwise direction is parallel to the direction connecting a source region and a drain region in a thin film transistor to be fabricated.